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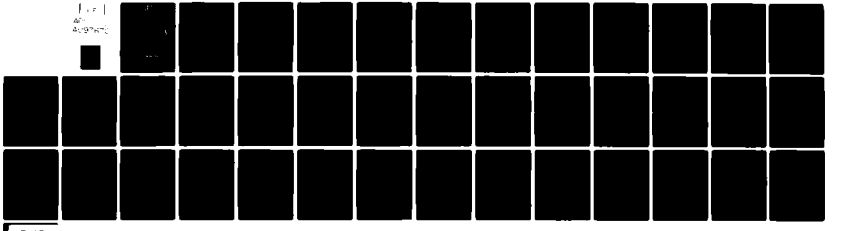

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INTERIM REPORT

THE AIR FORCE NONDESTRUCTIVE INSPECTION MANAGEMENT INFORMATION SYSTEM DEVELOPMENT PROGRAM

PHASE II — PRELIMINARY DESIGN AND APPROVAL

TASK 2 — ON-SITE DATA COLLECTION

12 40

David E. Franck
Robert Eaton

11 March 1981

Prepared for
DEPARTMENT OF THE AIR FORCE
AIR FORCE NONDESTRUCTIVE INSPECTION PROGRAM OFFICE
SAN ANTONIO AIR LOGISTICS CENTER
KELLY AIR FORCE BASE, TEXAS
under Contract F41608-79-D-A014/0004

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ARINC RESEARCH CORPORATION
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This report summarizes the Task 2 activities of ARINC Research Corporation in support of Phase II of the Air Force Non-destructive Inspection (NDI) Program Office (MMEI) at the San Antonio Air Logistics Center (SAALC), Kelly Air Force Base, Texas. These activities, performed as part of Contract F41608-79-D-A014-0004, included field collection of NDI

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maintenance data to assess their applicability to a proposed NDI Management Information System. The objective of this task was to monitor NDI maintenance at three selected air bases and document the NDI activities by use of both the current Air Force NDI documentation procedures and NDI maintenance codes proposed in ARINC Research publication 1555-11-1-2068.

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PHASE II - PRELIMINARY DESIGN AND APPROVAL

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FOREWORD

This report summarizes the Task 2 activities of ARINC Research Corporation in support of Phase II of the Air Force Nondestructive Inspection (NDI) Program Office (MMEI) at the San Antonio Air Logistics Center (SAALC), Kelly Air Force Base, Texas. These activities, performed as part of Contract F41608-79-D-A014-0004, included field collection of NDI maintenance data to assess their applicability to a proposed NDI Management Information System. The objective of this task was to monitor NDI maintenance at three selected air bases and document the NDI activities by use of both the current Air Force NDI documentation procedures and NDI maintenance codes proposed in ARINC Research publication 1555-11-1-2068.

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CHAPTER ONE

INTRODUCTION

This interim report briefly documents the efforts, findings, and conclusions of Task 2, On-Site Data Collection of a multitask program. ARINC Research Corporation is performing preliminary engineering design and analysis efforts under Contract F41608-79-D-A014-0004, "Air Force NDI Management Information (MIS) System Development Program - Phase II, Preliminary Design and Approval," for the Air Force Nondestructive Inspection (NDI) Program Office at the San Antonio Air Logistics Center (SAALC/MMEI).

1.1 PROGRAM OFFICE BACKGROUND

NDI techniques are used to identify defects in materials without damaging the article under test. The purpose of NDI is to identify an impending failure in a structural material before the material fails catastrophically. NDI techniques permit making maximum use of a material before it has to be removed as a safety hazard. NDI methods used in the Air Force include fluorescent penetrant, magnetic particle, eddy current, ultrasonic, and radiographic testing. Air Force personnel use these methods to assure equipment integrity through a comprehensive NDI program for all major weapon systems and support equipment.

The Air Force NDI Program Office is responsible for managing and supporting all NDI activities throughout the Air Force. The Program Office is assisted by a monitor at each major command (MAJCOM), an NDI manager at each Air Logistics Center (ALC), and NDI monitors within system manager (SM) and item manager (IM) functions throughout the ALCs.

1.2 PROJECT BACKGROUND

Task 2 is the second of six tasks of the current contract. Together, these tasks make up Phase II of a three-phase program to develop and implement a MIS as part of an overall Air Force effort to improve the management effectiveness of Air Force NDI Program personnel.

A feasibility study performed in Phase I evaluated and documented the technical and economic feasibility of developing and implementing the proposed MIS. Phase II includes developing a preliminary design for the MIS, documenting need for the MIS, and preparing a Data Automation Requirement (DAR). Phase III will consist of the detailed design, programming, and implementation of the MIS, as well as the associated training and documentation.

The MIS development program was pursued as a result of a general lack of feedback to Air Force NDI managers on the type, extent, and findings of NDI activities throughout the Air Force. Currently, NDI maintenance is documented with nonspecific support general codes (SGCs) or other available codes in accordance with the Air Force Manual (AFM) 66-1 Maintenance Data Collection System (MDCS). Although some NDI-related maintenance

data are received and processed at HQ-AFLC, there are no known specific NDI-related data products produced by HQ-AFLC, other ALCs, or other Air Force organizations. As a result, NDI managers in the Air Force receive no information as to the status, progress, cost, effectiveness, or other characteristics of NDI efforts throughout the Air Force. Thus the Air Force NDI program is being managed without the necessary feedback for effective management decisions.

The finding of the feasibility study, completed in November 1979 under Contract F09603-78-G-4125-SA01, was that it would be technically and economically feasible to develop an NDI MIS within the structure of Air Force data processing (DP) resources. On the basis of the study results, the Program Office, with the assistance of ARINC Research, prepared and submitted to AFLC a Required System Capability (RSC) document. The RSC was approved by HQ-AFLC/LOE on 27 March 1980, providing the go-ahead for the current Phase II efforts.

1.3 TASK OBJECTIVES

The objectives of this task were to monitor the NDI maintenance activities performed at three selected air bases and to document these activities by use of both the current AFM 66-1 MDCS documentation procedures and the NDI maintenance codes proposed by ARINC Research.

CHAPTER TWO

DATA COLLECTION AND FINDINGS

For a realistic evaluation of proposed NDI maintenance codes, ARINC Research collected NDI maintenance data for approximately one month at each of three bases. These bases, selected by the Program Office, were Laughlin Air Force Base, Texas (Air Training Command), Williams Air Force Base, Arizona (Air Training Command), and Luke Air Force Base, Arizona (Tactical Air Command). The following paragraphs describe the efforts and findings associated with this data collection task.

2.1 DATA CODES

Two methods to document NDI were used during the on-site data collection process. These methods were the current procedures used by NDI technicians under AFM 66-1 MDCS rules and the NDI maintenance codes proposed by ARINC Research. The maintenance codes used in these two procedures are shown in Tables 1A and 1B.

Table 1A. CURRENTLY USED NDI MAINTENANCE DATA CODES

	Type Maintenance Code	Support General Code (SGC) Work Unit Code (WUC)	Action Taken Code	When Discovered Code	How Malfunction Code
Simplified - SGC Usage	S - Special T - TCTO Compliance	0411B - NDI, Unscheduled 04610 - NDI 04630 - R&D NDI	NA	NA	NA
Typical Air Force Documentation Procedure	S - Special T - TCTO Compliance P - Periodic	Appropriate WUC of aircraft component inspected	X - Test, inspect, service B - Off equipment, no repair	U - NDI, all types (includes SOAP)	230 - Contaminated 917 - Impending failure 804 - No defect 799 - No defect 190 - Cracked, etc.

Table 1B. PROPOSED NDI MAINTENANCE DATA CODES

Type Maintenance Code	Work Unit Code*(WUC)	Action Taken Code	When Discovered Code** (New Codes)	How Malfunction Code
B - Unscheduled maintenance P - Periodic inspection (scheduled) S - Special inspection T - TCTO compliance	Appropriate WUC of aircraft component inspected	H - On equipment, no repair W - On equipment, service required (new code) B - Off equipment, no repair C - Off equipment, service required	0 - Eddy current 1 - Magnetic particle 7 - X-Ray 8 - Ultrasonic 9 - Fluorescent penetrant	917-NDI Impending defect 799-No defect

* Note: Support general codes for NDI will be eliminated.
** Note: When discovered code U changed to SOAP only.

In our review we found that NDI maintenance is generally being documented in accordance with the existing documentation rules of the AFM 66-1 MDCS. These rules allow NDI maintenance actions to be documented by using one of two procedures: a simplified procedure using support general codes (SGCs) designed to document general-level base support work and often used to justify support requirements, and the procedure used by most other Air Force maintenance activities, which includes when discovered code (WDC)-U* various applicable how malfunction codes, action taken codes, type maintenance codes, and work unit codes.

Only three SGCs are available to specifically document NDI: 0411B - NDI, unscheduled; 04610 - NDI, all types; and 04630 - R&D NDI. Other SGCs are also used within the rules of the AFM-66-1 to document NDI, e.g., during phase inspections. The use of SGCs precludes using all other maintenance codes except the type maintenance code.

The second procedure is common to most Air Force maintenance and is widely known and used throughout the Air Force. However, it requires the NDI technician to choose from many different codes, often with little guidance. As a result there is little consistency in the many code combinations used to document NDI. The only code consistently used is WDC-U which is shared with SOAP maintenance.

A major problem results from having two different procedures for documenting NDI maintenance. The problem is an inherent lack of accuracy and consistency in the data resulting in a divergent and non-coherent

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* WDC-U is defined in AFM 66-1 as: NDI, all types (including SOAP)

data base that allows a large variety of codes to be used to document a maintenance action. As a result, valid specific conclusions are nearly impossible to make.

The proposed NDI maintenance codes were developed by ARINC Research to provide the information necessary for an effective NDI MIS and to eliminate the problems inherent in the current documentation procedures. The basis for the proposed codes was the current AFM 66-1 system for data collection. The procedures will use the capabilities and data sources of the AFM 66-1 to provide the necessary details. The elimination of two different methods for documenting the same NDI maintenance activity and restricting the number of data codes necessary will provide a single, consistent method of documentation. We believe that such a single, cohesive data base can be used as an accurate and consistent reflection of NDI activities throughout the Air Force.

It should be noted that only two "how malfunction" codes are shown in Table 1B. This is in consonance with the Air Force policy that NDI technicians should determine only whether a part has a defect or does not have a defect. The technicians are not to make a determination as to serviceability or disposition of the inspected part.

A comparison of the information provided by the current and proposed coding methods is shown in Table 2. The "Information Needed" column was developed from current and prior work on the NDI MIS. As can be seen from Table 2, the currently used coding method can provide some usable information. However, it can also be seen that the proposed method provides considerably more of the information needed for managing NDI in the Air Force.

Table 2. INFORMATION CAPABILITIES OF CURRENT AND PROPOSED NDI DOCUMENTATION METHODS

INFORMATION NEEDED	CURRENT METHOD	PROPOSED METHOD
Total Inspection Man-hours	Yes	Yes
. By aircraft type	Yes	Yes
. By base/command	Yes	Yes
. By Work Unit Code	Partial *	Yes
. By part number	Partial **	Partial **
. By NDI method	No	Yes
Total NDI Inspections	Yes	Yes
. By aircraft type	Yes	Yes
. By base/command	Yes	Yes
. By Work Unit Code	Partial *	Yes
. By part number	Partial **	Partial **
. By NDI method	No	Yes
Inspection Results	Partial *	Yes
. By aircraft type	Partial *	Yes
. By base/command	Partial *	Yes
. By Work Unit Code	Partial *	Yes
. By part number	Partial **	Partial **
. By NDI method	No	Yes
. Man-hours expended	Partial *	Yes
Inspections by NDI Method	No	Yes
. By aircraft type	No	Yes
. By base/command	No	Yes
. By Work Unit Code	No	Yes
. By part number	No	Partial **
. Man-hours expended	No	Yes

* Studies show data provided for only 28.1 percent of inspections.

** Part number documentation provided only in off-equipment maintenance actions (58.2 percent).

2.2 DATA COLLECTION PROCEDURE

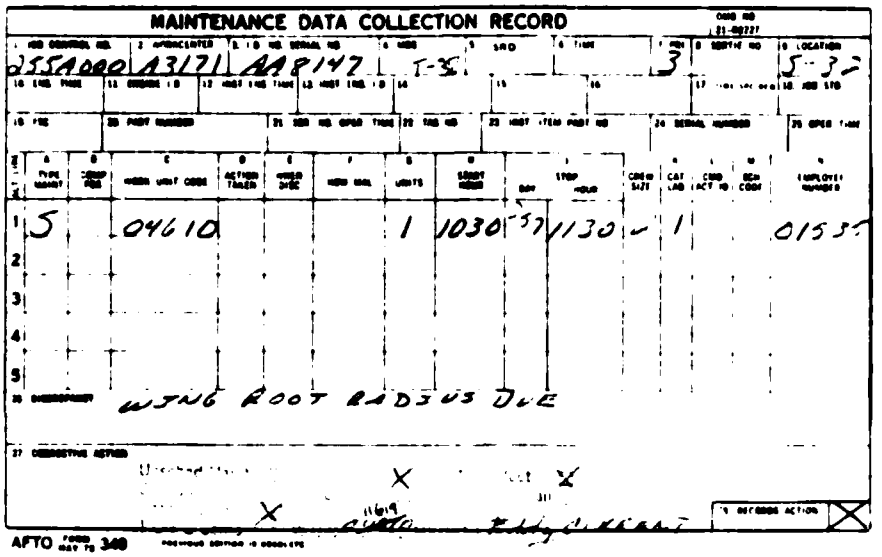
NDI maintenance data were collected by an ARINC Research field engineer at three air bases for approximately one month at each base during July, August, and September 1980. Two sets of AFTO Form 349, maintenance data collection records, were prepared for each inspection; one completed by the Air Force NDI technician using the current documentation procedures and the other completed by the on-site ARINC Research engineer using the proposed maintenance codes.

The ARINC Research field engineer collected a copy of each AFTO form 349 filled out by the NDI personnel. To complete these forms, personnel used the documentation procedures currently in use by that base in accordance with the AFM 66-1 MDCS requirements. This set of forms was used as a baseline for the study period at each base and to document the information available from the current documentation procedures. To help in the data collection, each form was stamped with a fill-in-the blank section for additional information. The accuracy of the additional data was confirmed by the ARINC Research field engineer.

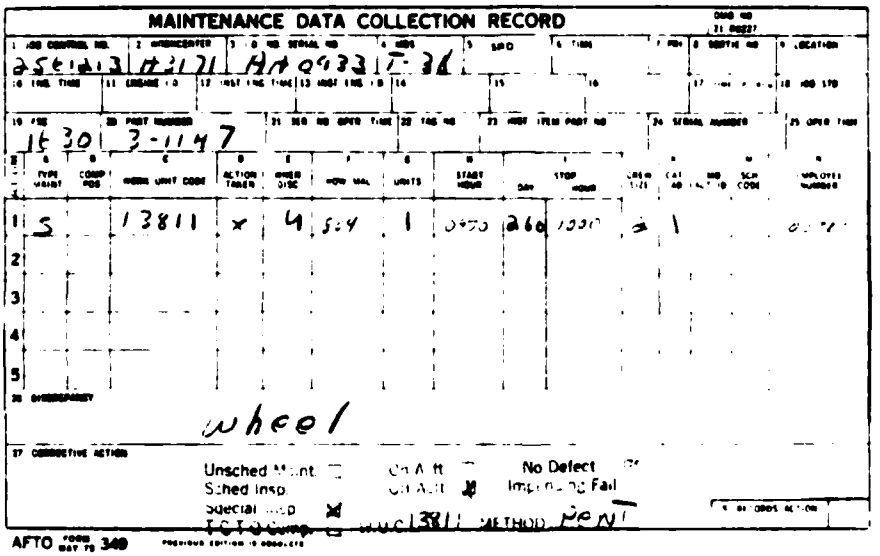
The ARINC Research field engineer then prepared a second set of AFTO Form 349s for each maintenance form filled out by the NDI technician. This second set of AFTO 349s was used to document the same inspection as the first form, but the ARINC Research proposed NDI maintenance codes were used to do this.

Figure 1 shows two AFTO 349s completed using the two current NDI documentation methods and a third AFTO 349 filled in by the ARINC field engineer. The added fill-in-the-blank section is at the bottom of the form. The first form shows the AFTO 349 filled in by the NDI technician using SGC 04610; the second AFTO 349 was filled in using "when discovered" code (WDC)-U and required additional maintenance codes. The third form was completed by the ARINC Research on-site engineer using the ARINC Research proposed NDI codes. Work time was converted to man-hours on the ARINC Research forms. Comparison of the three forms shows that the first form is relatively simple; the second and third forms are about equal in complexity. Note that the first form provides very little information as to what was inspected, how, why, and with what results. The second form includes all of that information except how the part was inspected (method of NDI) and whether it was an on or off equipment inspection. The third form is similar to the second, but also reports the method of NDI (fluorescent penetrant) and whether it was an on or off equipment inspection (off). The "action taken" (AT) code-X in the second form was used to indicate that the parts were subjected to "test-inspect-service...". "Action taken" code-X is intended in the AFM 66-1 to record on-equipment work, but was commonly used for off-equipment work. This is a common practice, resulting from a lack of readily understood documentation alternatives.

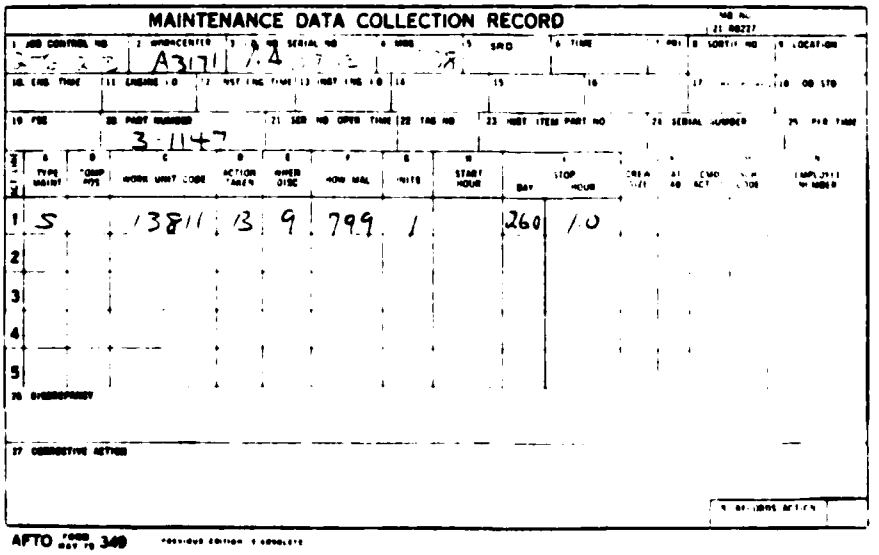
In comparing the current and proposed documentation methods, we found agreement among the NDI technicians that the single set of codes makes filling in the form easier because there is less to remember. As observed by the on-site engineer and as expressed by the NDI technicians, the impact of the proposed codes on filling in the maintenance forms was not significantly different from current practice.



SGC Method



WDC-U Method



ARINC Research
Proposed Method

Figure 1. AFTO 349 FORMS SHOWING NDI MAINTENANCE

2.3 FINDINGS

This section presents the findings of Task 2. Table 3 shows the number of maintenance actions performed during the data collection period and the number of inspections that were reported at each of the bases. We have drawn no conclusions and none should be attempted with these and subsequently presented data regarding the NDI operation at the individual bases. Similarly, inferences should not be extended from these data to other bases, aircraft or commands. The data collected were sufficient for demonstration of proof-of-principle only. The sample size is too small to support specific conclusions regarding NDI operations.

Table 3. NDI INSPECTION SUMMARY

Base	Number Maintenance Actions	Number of Inspections
Laughlin AFB	519	1662
Luke AFB	265	558
Williams AFB	635	1301
Total	1419	3521

Tables 4 and 5 display the NDI activities for a sample base (Luke) as reported by the current and proposed maintenance code reporting methods. The column marked "Units" is the number of units inspected and is equivalent to the number of inspections. NDI maintenance actions reported using methods other than the standard five methods, usually including visual or similar inspections, were documented under the "Other" column. Also, the term "NDR" is the no defect rate indicating the percentage of inspections not indicating a defect. Similar data for all bases are contained in Appendixes A and B. Equivalent information, corresponding to that in Table 4, but collected using the proposed NDI maintenance codes, is presented in Table 5. A comparison of the two tables makes clear the additional information provided by use of the proposed NDI codes.

The current NDI reporting method provides a summary of units inspected and man-hours expended by aircraft. Information on the items inspected and defects discovered is only partially available. The proposed reporting method also provides a summary of expended man-hours and units inspected by aircraft, but additionally indicates the number of defects detected for all inspections. All man-hour, unit, and defect values will be reported by NDI test method for individual items identified by a 5-digit WUC in the proposed procedure. Table 6 presents an example of the comprehensive WUC detail available by the proposed NDI code reporting method. In the Table 6 example, a clear and concise picture of all NDI activity for F-4s at Luke AFB during the period from August 28 to September 18, 1980 is presented. The proposed NDI reporting codes yield useful information about

Table 4. LUKE AIR FORCE BASE
CURRENT CODE SUMMARY
(8/28/80 - 9/18/80)

CATEGORY OF MDI		WEAPON SYSTEM														TOTAL	
DESCRIPTION		CH-3			F-4			F-15			T-33			OTHER				
	Code	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units
TCTO																		
	01577				15.00	3	N/A										15.00	3
Misc.Inspections																		
	03114													1.00	1	N/A	1.00	1
	033[illegible]				7.50	0											7.50	0
	03310				3.00	0	N/A										3.00	0
	03320				3.96	0											3.96	0
	03400				3.75	0											3.75	0
	03550										6.30	0	N/A				6.30	0
NDI																		
	04116							321.76	146								321.76	146
	04610	33.42	62	N/A	214.99	235	N/A	19.33	4	N/A	26.0	57	N/A	31.51	46	N/A	325.25	404
	043AT							40.67	4								40.67	4
TOTAL	Current	33.42	62	N/A	248.20	238	N/A	381.76	154	N/A	32.3	57	N/A	32.51	47	N/A	728.19	558

Table 5. LUKE AIR FORCE BASE
PROPOSED CODE SUMMARY
(8/28/80 - 9/18/80)

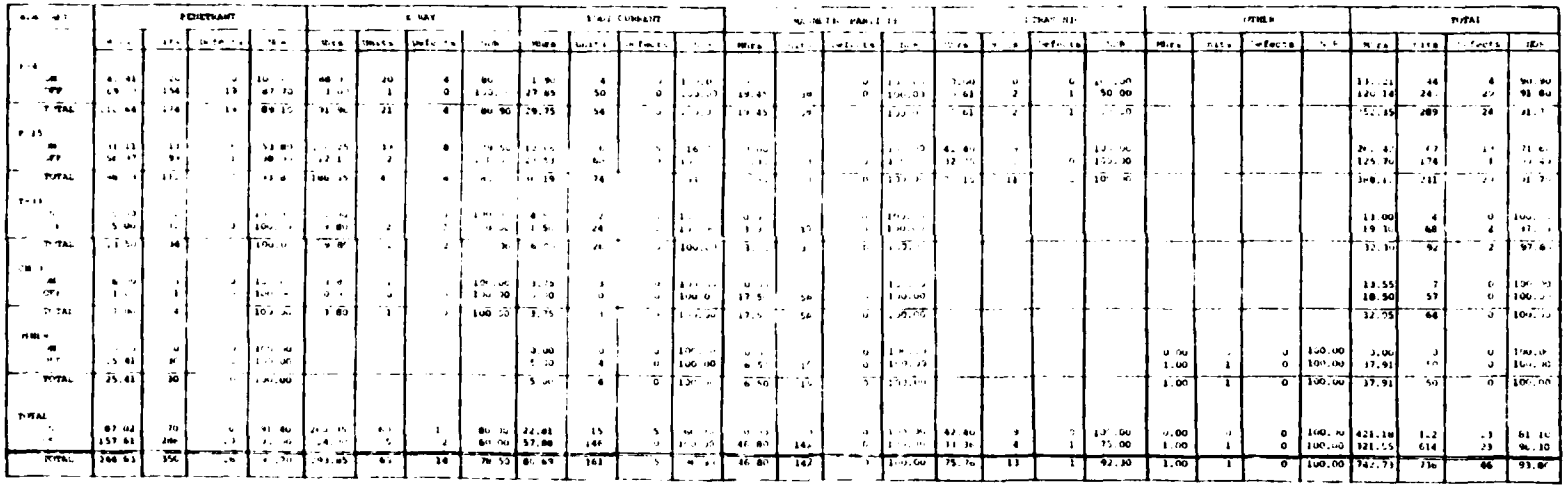


Table 6. LUKE AIR FORCE BASE
PROPOSED CODES - WUC SUMMARY
(8/28/80 - 9/18/80)

AIRCRAFT F-4	PENETRANT				X-RAY				EDDY CURRENT				MAGNETIC PARTICLE				ULTRASONIC				OTHER				TOTAL			
WUC	Mhrs	Units	Defects	MDR	Mhrs	Units	Defects	MDR	Mhrs	Units	Defects	MDR	Mhrs	Units	Defects	MDR	Mhrs	Units	Defects	MDR	Mhrs	Units	Defects	MDR	Mhrs	Units	Defects	MDR
01577(SCTR)					16.00	4	0	100.00																	16.00	4	0	100.00
Fuselage																												
1116G					9.10	2	0	100.00																	9.10	2	0	100.00
1116Q					0.70	2	1	50.00																	0.70	2	1	50.00
1121Q					27.20	5	3	60.00																	27.20	5	3	60.00
1123B	1.50	1	0	100.00																					1.50	1	0	100.00
1131Q					30.90	8	1	87.50																	30.90	8	1	87.50
1132C									.50	1	0	100.00					0.61	2	1	50.00					3.33	3	1	66.70
Landing Gear																												
12199													2.00	24	0	100.00									2.00	24	0	100.00
12218	3.00	1	0	100.00																					3.00	1	0	100.00
1225A	8.10	19	0	100.00					18.75	29	0	100.00	1.00	2	0	100.00									27.85	50	0	100.00
1226A	7.65	16	0	100.00					1.00	2	0	100.00	5.50	7	0	100.00									14.15	25	0	100.00
12230	3.00	1	0	100.00																					2.00	2	0	100.00
Flight Control																												
14610	6.00	2	0	100.00					2.90	5	0	100.00													8.90	7	0	100.00
Engines																												
23100	1.00	1	0	100.00																					1.00	1	0	100.00
23108													1.50	1	0	100.00									1.50	1	0	100.00
23313	11.73	46	14	69.60																					11.73	46	14	69.60
23316	1.00	4	4	0.00																					1.00	4	4	0.00
23538	2.00	14	0	100.00																					2.00	14	0	100.00
23613	4.73	4	0	100.00																					4.73	4	0	100.00
23618	5.00	2	0	100.00																					5.00	2	0	100.00
2390A	4.05	4	0	100.00																					4.05	4	0	100.00
2390B	6.90	6	0	100.00																					6.90	6	0	100.00
2390F	3.00	1	0	100.00																					3.00	1	0	100.00
2390L	1.90	1	0	100.00									8.45	3	0	100.00									10.35	5	0	100.00
Preservation																												
41230	0.75	1	0	100.00																					0.75	1	0	100.00
41F3F	8.00	2	0	100.00																					8.00	2	0	100.00
4123G	7.00	6	1	83.33																					7.00	6	1	83.30
4152A	4.00	2	0	100.00																					4.00	1	0	100.00
Fuel System																												
46246	2.33	3	0	100.00																					2.33	3	0	100.00
46248	7.50	18	0	100.00																					7.50	18	0	100.00
Weapon Deliv.																												
75140	3.00	1	0	100.00									1.00	2	0	100.00									4.00	3	0	100.00
75210	10.10	17	0	100.00					6.60	17	0	100.00													17.10	34	0	100.00
TOTAL	110.04	176	19	89.18	91.90	21	4	80.80	29.75	54	0	100.00	19.45	38	0	100.00	0.61	2	1	50.00					254.15	299	24	91.70

the items inspected on each aircraft; how many were inspected, what inspection methods were used, and how many defects were discovered. This information can help management decide such issues as: whether to increase or decrease scheduled NDI on the basis of no-defect rate, how to procure and utilize NDI equipment, and where best to apply available manpower.

Several differences were noted when comparing the data collected using the current procedures and using the proposed procedures. A comparative summary of these differences is presented in Table 7. The man-hour difference is mostly due to the inspection times often being filled in at the end of the day rather than as work is completed. This situation is not likely to be altered. The differences in the number of inspections reported are due to two conditions. First, two or more inspections were often performed and reported as only one inspection. Second, zero units were sometimes entered for an inspection. The difference in defects reported is due to defects detected which are not documented when using SGCs. Once again, only general trends may be inferred from this summary. The sample size is too small to make specific management decisions pertaining to a particular base.

Table 7.

Summary of Data Gathered Using
Current and Proposed NDI Documentation Procedures

BASE	CURRENT	PROPOSED	DIFFERENCE
	MAN-HOURS		
Laughlin	850.53	860.43	9.90
Luke	728.19	742.73	14.54
Williams	1049.04	1057.72	8.68
Totals	2627.76	2660.88	33.12
	INSPECTIONS		
Laughlin	1662	1668	6
Luke	558	736	178
Williams	1301	1367	66
TOTALS	3521	3771	250
	DEFECTS		
Laughlin	0	56	56
Luke	0	46	46
Williams	74	99	25
TOTALS	74	201	127

2.4 AFDSDC NDI MAINTENANCE CODE REVIEW

To assure the continued viability and feasibility of the proposed NDI coding procedures, we reviewed them with MSgt. L. Slider of the Air Force Data System Design Center (AFDSDC) at Gunter AFS, Alabama. MSgt. Slider is the on-site expert on the AFM 66-1 at the AFDSDC. During this meeting, we discussed details related to how the proposed codes would be implemented and used. The following are conclusions of that meeting.

First, MSgt. Slider indicated his concurrence that the proposed NDI codes would provide information that is greatly superior to information provided by current codes. Second, there is still time to implement the proposed NDI codes in the AFM 66-1 with minimal effort and minimal disturbance to the system in total. Third, Time Compliance Technical Order (TCTO) information will be collected as a second line on the AFTO 349 to document NDI details of the inspection, but to prevent duplicate accounting, man-hours information will not be available. Fourth, the MAJCOM and the Air Staff must review and coordinate the proposed NDI codes. This can begin before preparation of the Data Automation Requirement (DAR) with the provision that approval of the proposed NDI codes is subject to approval of the DAR. Implementation will then begin after the DAR is approved. It is estimated that three months would be required to completely implement and test the proposed NDI codes and have all bases converted to their use.

2.5 SUMMARY

Current NDI reporting methods have been observed, reviewed, and analyzed by ARINC Research. Coding practices using SGCs and WDC-U were observed and actual AFTO Form 349s were obtained from sample bases. We used the proposed NDI reporting codes to record inspections along with the current reporting method for comparison.

Analysis of AFTO Form 349s reveals a fragmented and incomplete picture of NDI base activity. The current coding practices permit two reporting methodologies which are confusing because they offer a variety of codes from which to chose.

Proposed NDI codes demonstrate four qualities:

- They are compatible with the field environment.
- They can more accurately reflect performance and details of an inspection (e.g. method, results).
- They simplify documentation by reducing the number of codes to select from and by presenting a single documentation procedure.
- Their implementation and use would result in no significant increase in documentation workload.

On the basis of these findings ARINC Research recommends that the NDI MIS be implemented with the proposed codes.

CHAPTER THREE

CONCLUSIONS AND RECOMMENDATION

3.1 CONCLUSIONS

The following conclusions have been drawn from the results of the Task 2 contract activities.

- The current AFM 66-1 procedures can provide only general information regarding NDI maintenance.
- The revised NDI coding procedures provide considerable improvement over current procedures in documenting the information necessary for a successful management information system with little or no impact on data collection efforts.
- The NDI coding procedures proposed by ARINC Research are currently compatible with the AFM 66-1 system.*

3.2 RECOMMENDATION

We recommend that the proposed NDI coding procedures be implemented in conjunction with preparation of a Data Automation Requirement (DAR).

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* Future revisions to the AFM 66-1 may require reassessment of this compatibility.

APPENDIX A

BASE NDI DATA - CURRENT NDI DATA CODES

Luke Air Force Base (8/28/80 - 9/18/80) - Current Codes

CATEGORY OF NDI	WEAPON SYSTEM															TOTAL	
DESCRIPTION	CH-3			F-4			F-15			T-33			OTHER				
Code	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units
TCTO																	
01577				15.00	3	N/A										15.00	3
Misc.Inspections																	
03114													1.00	1	N/A	1.00	1
03300				7.50	0											7.50	0
03310				3.00	0	N/A										3.00	0
03320				3.96	0											3.96	0
03400				3.75	0											3.75	0
03550										6.30	0	N/A				6.30	0
NDI																	
0411B							321.76	146								321.76	146
04610	33.42	62	N/A	214.99	235	N/A	19.33	4	N/A	26.0	57	N/A	31.51	46	N/A	325.25	404
043AT							40.67	4								40.67	4
TOTAL Current	33.42	62	N/A	248.20	238	N/A	381.76	154	N/A	32.3	57	N/A	32.51	47	N/A	728.19	558

Laughlin Air Force Base (7/18/80 - 8/13/80) - Current Codes

CATEGORY OF NDI	WEAPON SYSTEM														
DESCRIPTION	T-37			T-38											
Code	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects
Misc. Inspections															
03300				3.00	1										
03400	3.00	1		53.00	17										
03710	9.00	1													
03720	5.00	2													
NDI															
0411B	199.27	169		286.33	223										
04610	129.25	75		146.43	1154										
Fuselage															
11000	1.50	2	0												
1132L	0.50	1	0												
11532				0.50	1	0									
Landing Gear															
13121	2.00	3	0												
13138	1.00	2	0												
1313B	1.00	2	0												
13213	1.00	2	0												
13811				0.75	1	0									

CATEGORY OF MDI	WEAPON SYSTEM														
DESCRIPTION	T-37			T-38											
Code	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects
Landing Gear (Cont.)															
13821				1.00	1	0									
Engine															
23AAB	1.00	1	0												
23BFA				2.00	1	0									
23CAB				2.00	1	0									
23FAE	2.00	1	0												
TOTAL Current	355.52	262	0	495.01	1400	0									

Williams Air Force Base (8/27/80 - 9/18/80) - Current Codes

CATEGORY OF NDI	WEAPON SYSTEM														
DESCRIPTION	F-5			T-38			T-37			OTHER					
Code	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects
TCTO				1.00	1										
Misc. Inspections															
03300				4.00	0										
03400	32.20	0		31.75	0										
03710							17.50	1							
03720							3.00	0							
NDI															
04610	105.82	58		209.17	157		15.06	8							
Fuselage															
11143				10.00	1	0									
11532				26.74	29	0									
1153G				0.67	1	0									
11722				2.00	2	0									
11725				1.00	2	0									
1173A	2.00	1	0												
11JE9	1.50	2													
11LA9	1.50	3													
11LAB	1.00	1													

CATEGORY OF NDI	WEAPON SYSTEM														
DESCRIPTION	F-5			T-38			T-37			OTHER					
Code	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects
Accessories															
12111							32.34	158	1						
12113							5.67	64	0						
12114							3.00	8	1						
12115							10.00	12	0						
Landing Gear															
13000	2.00	1	0	11.91	17	0									
1311A				2.00	1	0									
13112							2.00	1	0						
13113							3.00	20	0						
13116				4.00	6	0									
13119				1.00	1	0									
13126							2.80	2	0						
1321F							9.67	7	0						
13611	6.00	12	0	12.00	57	0									
1361H	0.50	2	0	8.16	11	0									
1361J	0.50	2	0	5.17	40	3									
1361K							2.00	1	0						
13712							13.50	7	0						
1371A							27.50	16	0						
13811				37.34	22	1									
13821				6.33	5	0									

CATEGORY OF MDI	WEAPON SYSTEM														
DESCRIPTION	F-5			T-38			T-37			OTHER					
Code	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects
Landing Gear (Cont.)															
13831	0.50	1	0												
13AAE	3.00	14	0												
13AAR	3.00	2	0												
13DCA							2.00	1	0						
13LAA	11.84	46	0												
13LAN	2.34	13	0												
13LAX	3.00	5	0												
13LAY	5.00	6	0												
13QAA	1.47	2	0												
Flight Controls															
14222				0.67	1	0									
1451A				2.00	2	0									
141EE	0.50	1	0												
Ladder															
22300										2.50	2	2			

CATEGORY OF MDI	WEAPON SYSTEM														
DESCRIPTION	F-5			T-38			T-37			OTHER					
Code	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects
Engine															
23BCD				9.35	6	1									
23BCT	5.00	63	0	7.50	153	0									
23BDO	2.00	2	0	22.50	15	0									
23BEO				3.00	2	0									
23BFA				2.16	2	0									
23BJA	2.00	1	0												
23CAO	2.00	1	1	6.13	4	3	2.00	1	0						
23CAA				6.20	4	4									
23CAB							2.67	2	0						
23CAP							7.87	6	2						
23CBO	3.00	3	0	3.00	2	0									
23CHR							1.00	1	0						
23DAO				2.00	1	0									
23DAP				6.00	2	0									
23DAD	5.33	4	3	49.19	28	18									
23DCQ				12.00	8	3									
23EAG							15.80	9	0						
23FAA							6.30	7	6						
23FAB							3.00	3	1						
23FAC							7.50	6	4						
23FAE							69.79	58	15						
23FAF							4.00	3	2						
23FAG				2.00	1	0									

CATEGORY OF NDI	WEAPON SYSTEM														
DESCRIPTION	F-5			T-38			T-37			OTHER					
Code	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects	Mhrs	Units	Defects
Engine (Cont..															
23FAP							4.00	2	2						
23KA?	2.00	2	0	7.00	4	0									
23KAB							4.00	1	0						
23KAH							3.70	2	0						
23KAL	3.80	3	0	12.50	7	0									
23KAM	2.67	3	0	10.66	8	0									
23KAN	1.00	2	0	4.50	3	0									
23LAP							4.00	1	1						
TOTAL Current	212.77	284	4	549.10	607	33	284.07	408	35	2.50	2	2			

APPENDIX B

BASE NDI DATA - PROPOSED NDI DATA CODES

Luke Air Force Base (8/28/80 - 9/18/80) - Proposed Codes

AIRCRAFT	PENETRANT				X-RAY				EDDY CURRENT				MAGNETIC PARTICLE				ULTRASONIC				OTHER				TOTAL			
	Hours	Units	Defects	%DR	Hours	Units	Defects	%DR	Hours	Units	Defects	%DR	Hours	Units	Defects	%DR	Hours	Units	Defects	%DR	Hours	Units	Defects	%DR	Hours	Units	Defects	%DR
F-4																												
AB	41.41	41	0	100.00	68.40	40	4	90.	1.90	4	0	100.00	0.00	0	0	100.00	0.00	0	0	100.00					113.71	44	4	90.90
APP	69.23	154	19	87.70	3.00	1	0	100.00	47.85	50	0	100.00	19.45	38	0	100.00	0.61	2	1	50.00					140.14	245	20	91.80
TOTAL	111.64	176	19	89.23	91.90	41	4	90.90	49.75	54	0	100.00	19.45	38	0	100.00	0.61	2	1	50.00					253.85	289	24	91.71
F-15																												
AB	11.11	13	4	53.80	170.45	19	8	79.50	12.66	6	5	16.70	0.00	0	0	100.00	42.40	9	0	100.00					236.62	47	17	71.60
APP	56.33	99	3	96.90	122.10	2	1	100.00	21.53	68	0	100.00	1.35	3	0	100.00	32.75	2	1	50.00					125.70	174	1	99.40
TOTAL	67.44	112	7	93.80	180.55	41	8	80.5	34.19	74	5	93.50	1.35	3	0	100.00	75.15	11	1	90.90					362.32	221	21	91.7
F-111																												
AB	8.50	4	0	100.00	0.70	1	0	100.	4.00	4	0	100.00	0.00	0	0	100.									13.00	4	0	100.00
APP	5.00	12	0	100.00	4.80	1	2	0.00	1.50	44	0	100.00	8.75	50	0	100.00									19.05	88	4	97.70
TOTAL	13.50	16	0	100.00	5.50	2	2	0.00	6.00	48	0	100.00	8.75	50	0	100.00									32.05	92	2	97.80
CH-3																												
AB	6.00	8	0	100.	1.00	1	1	100.00	3.75	3	0	100.00	0.00	0	0	100.00									13.55	7		100.00
APP	1.00	1	0	100.00	0.00	0	0	100.00	.00	0	0	100.00	17.50	56	0	100.00									18.50	57	0	100.00
TOTAL	7.00	9	0	100.00	1.00	1	1	100.00	3.75	3	0	100.00	17.50	56	0	100.00									32.05	64		100.00
OTHER																												
AB	1.00	0	0	100.00					0.00	0	0	100.00	0.00	0	0	100.00					0.00	0	0	100.00	1.00	0	0	100.00
APP	25.41	30	0	100.00					5.00	4	0	100.00	6.50	15	0	100.00					1.00	1	0	100.00	37.91	51	0	100.00
TOTAL	25.41	30	0	100.00					5.00	4	0	100.00	6.50	15	0	100.00					1.00	1	0	100.00	37.91	51	0	100.00
TOTAL																												
AB	82.52	70	0	81.40	246.95	23	11	80.10	22.81	15	5	66.70	0.00	0	0	100.00	42.40	9	0	100.00	1.00	2	0	100.00	421.18	119	23	81.10
APP	157.61	286	23	92.40	24.90	5	2	60.00	57.88	146	0	100.00	40.80	142	0	100.00	33.36	4	1	75.00	1.50	1	0	100.00	321.55	614	23	96.30
TOTAL	240.63	356	26	92.70	271.85	28	13	68.50	80.69	161	5	96.90	40.80	142	0	100.00	75.76	13	1	92.90	1.00	3	0	100.00	742.73	733	46	93.80

Laughlin Air Force Base (7/18/80 - 8/13/80) - Proposed Codes

AIRCRAFT	PENETRANT				X-RAY				EDDY CURRENT				MAGNETIC PARTICLE				ULTRASONIC				OTHER				TOTAL			
	Mhrs	Units	Defects	NDR	Mhrs	Units	Defects	NDR	Mhrs	Units	Defects	NDR	Mhrs	Units	Defects	NDR	Mhrs	Units	Defects	NDR	Mhrs	Units	Defects	NDR	Mhrs	Units	Defects	NDR
T-37																												
OR	7.00	4	0	100.00	11.00	2	1	50.00	1.50	1	0	100.00	7.00	4	0	100.00	1.50	2	0	100.00					28.00	17	1	94.12
OFF	261.40	172	23	86.47	1.00	1	0	100.00					53.22	75	1	100.00					2.50	2	0	100.00	318.12	248	23	90.73
TOTAL	268.40	176	23	86.78	12.00	3	1	66.67	1.50	1	0	100.00	60.22	79	1	100.00	1.50	2	0	100.00	2.50	2	0	100.00	346.12	265	24	90.94
T-38																												
OR	43.17	13	4	69.24	21.00	6	4	33.33	78.83	38	1	97.37	2.00	12	0	100.00	25.84	14	2	85.71	1.00	1	1	0.00	187.83	125	14	88.80
OFF	127.66	275	13	95.27	12.00	4	1	75.00					73.08	498	2	99.33									516.64	1278	18	98.59
TOTAL	170.83	1010	17	98.32	41.00	10	7	30.00	78.83	38	1	97.37	75.08	510	2	99.39	25.84	14	2	85.71	1.00	1	1	0.00	504.31	1403	32	97.72
TOTAL																												
OR	50.17	30	4	93.34	32.00	8	5	37.50	80.33	41	1	97.56	9.00	16	0	100.00	27.34	16	2	87.50	2.50	3	1	0.00	225.83	142	15	89.44
OFF	388.06	1147	36	96.86	13.00	5	1	61.54					126.30	573	3	99.48					2.50	2	0	100.00	634.80	1526	41	97.31
TOTAL	544.73	1181	40	96.62	45.00	13	6	53.33	80.33	41	1	97.56	135.30	589	3	99.49	27.34	16	2	87.50	5.00	5	1	60.00	860.63	1668	56	96.64

Williams Air Force Base (8/27/80 - 9/18/80) - Proposed Codes

AIRCRAFT	PENETRANT				X RAY				EDDY CURRENT				MAGNETIC PARTICLE				ULTRA-SONIC				OTHER				TOTAL			
	MHrs	Units	Defects	MDR	MHrs	Units	Defects	MDR	MHrs	Units	Defects	MDR	MHrs	Units	Defects	MDR	MHrs	Units	Defects	MDR	MHrs	Units	Defects	MDR	MHrs	Units	Defects	MDR
F-15																												
ON	8.70	4	2	50.00	19.50	4	1	75.00					2.00	1	0	100.00												
OFF	204.62	270	18	93.33	0.00	0	0	100.00					56.19	137	17	87.59					1.00	1	1	0.00	33.20	10	4	60.00
TOTAL	213.32	274	20	92.70	19.50	4	1	75.00					58.19	138	17	87.59					0.00	0	0	100.00	260.81	407	35	91.40
T-38																					1.00	1	1	0.00	292.01	417	39	90.65
ON	66.38	44	4	90.91	46.55	11	5	54.55	89.81	54	1	98.15	4.00	1	0	100.00	45.47	16	1	93.75	0.00	0	0	100.00	231.51	127	11	91.34
OFF	139.61	153	29	81.05	13.66	10	3	70.00	0.00	0	0	100.00	164.74	165	1	99.33	0.0	0	0	100.00	3.00	1	1	0.00	321.01	529	38	93.57
TOTAL	205.69	197	33	83.25	60.21	20	8	60.00	89.81	54	1	98.15	168.74	166	1	99.33	45.47	16	1	93.75	3.00	1	1	0.00	552.52	656	45	91.14
T-9																												
ON	24.35	12	1	75.00	33.63	17	3	75.00	28.75	14	1	92.86	13.75	6	1	100.00	4.25	4	0	100.00	39.68	28	1	96.43	146.38	76	8	89.47
OFF	18.28	30	1	96.00	0.33	2	2	0.00	0.00	0	0	100.00	46.70	184	0	100.00	0.00	0	0	100.00	0.00	0	0	100.00	65.31	216	5	97.68
TOTAL	42.63	42	6	85.71	33.96	19	5	84.21	28.75	14	1	92.86	60.45	190	1	100.00	4.25	4	0	100.00	39.68	28	1	96.43	211.69	292	13	95.55
OTHER																												
ON																					0.00	0	0	100.00	0.00	0	0	100.00
OFF																					3.50	2	2	0.00	1.50	2	2	0.00
TOTAL																					3.50	2	2	0.00	1.50	2	2	0.00
F-111																												
ON	99.13	70	9	85.71	105.63	46	7	84.78	114.16	64	2	96.88	13.75	4	0	100.00	23.72	20	1	95.00	46.00	34	4	91.18	404.39	243	25	89.71
OFF	162.51	453	50	88.96	13.99	12	7	58.33	0.00	0	0	100.00	53.63	606	16	97.36	0.00	0	0	100.00	4.50	1	1	0.00	234.63	1154	76	93.41
TOTAL	461.64	523	59	88.50	119.62	58	14	75.86	114.16	68	2	97.41	67.38	610	16	97.38	29.72	20	1	95.00	45.14	35	5	84.00	639.02	1397	101	92.77


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